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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,286	03/27/2007	Katsumi Kushiya	Q95660	4082
23373 7590 02/01/2010 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
EXAMINER				
WALCK, BRIAN D				
ART UNIT		PAPER NUMBER		
1793				
NOTIFICATION DATE		DELIVERY MODE		
02/01/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/584,286

**Applicant(s)**

KUSHIYA ET AL.

**Examiner**

Brian Walck

**Art Unit**

1793

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 October 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 March 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/GS/US)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of Claims***

1. Claims 1-2 are canceled. Claims 3-6 are pending where claim 6 has been amended.

### ***Status of Previous Rejections***

2. The previous 35 USC § 112 rejections of the claims have been withdrawn in view of amendments to the claims.
3. The previous 35 USC § 102/103 rejections of the claims have been maintained.

### ***Claim Rejections - 35 USC § 102/103***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
8. **Claims 3-5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 2002-319686 to Shimakawa et al (cited by applicant in IDS, an English translation has been provided with this office action for applicant's convenience).**

Regarding claim 3, Shimakawa discloses a process for producing an integrated thin-film solar cell comprising a substrate and constitutional thin films containing a metal back electrode layer on the substrate, a multi-element compound semiconductor thin film having a p-type conductivity and being provided as a light absorbing layer on the metal back electrode layer, a metal oxide semiconductor thin film having an opposite type conductivity against the multi-element compound semiconductor thin film, having a wider bandgap, being transparent, having electroconductivity, and being provided as a window layer on the multi-element compound semiconductor thin film, and a buffer layer comprising a mixed crystal compound semiconductor thin film at an interface between

the light absorbing layer and the window layer, wherein the process comprises a first patterning step of patterning (forming a pattern) by removing a part of the metal back electrode layer in a thin line form, a second patterning step of patterning (forming a pattern) by removing a part of the light absorbing layer or a part of the light absorbing layer and the buffer layer in a thin line form with a prescribed offset with respect to the pattern formed in the first patterning step as a reference position, and a third patterning step of patterning (forming a pattern) by removing a part of the light absorbing layer, the buffer layer and the window layer in a thin line form with a prescribed offset with respect to the pattern formed in the first patterning step or the second patterning step as a reference position, wherein the second patterning step and the third patterning step are conducted by a mechanical scribing method of removing a part of a target accumulated thin film layer by mechanically scribing with a metal stylus having a pointed tip end, in which the tip end of the metal stylus is slid to remove the layers up to the light absorbing layer by mechanically scribing, and wherein the first patterning step, the second patterning step and the third patterning step are conducted in this order, so as to remove mechanically the constitutional thin film layers of the target thin-film solar cell and to form grooves or gaps for dividing the thin-film solar cell into unit cells in a strip shape, whereby an integrated thin-film solar cell having a structure containing a prescribed number of the divided unit cells being connected in series is obtained (Shimakawa, para [0004-0005] and figure 5)

Shimakawa does not explicitly disclose using an ultrathin film layer formed secondarily on a surface of the metal back electrode layer upon forming the light

absorbing layer as a solid lubricant for the mechanical scribing step. However, Shimakawa discloses that a thin film of  $\text{MoSe}_2$  exists on a surface of the metal back electrode layer (Shimakawa, para [0007]). This  $\text{MoSe}_2$  layer would either inherently or would be expected to act as a solid lubricant for the mechanical scribing step as the mechanical scribing step of Shimakawa appears to be no different than the instantly claimed mechanical scribing step. Therefore, a rejection based alternatively on either 35 U.S.C. 102(b) or 35 U.S.C. 103(a) is eminently fair and acceptable.

Regarding claim 4, Shimakawa discloses that the metal back electrode layer is molybdenum and the first patterning step is conducted by a laser method (Shimakawa, para [0004]).

Regarding claim 5, Shimakawa discloses that the metal back electrode layer is molybdenum, and the ultrathin film layer formed secondarily on the surface of the metal back electrode layer is molybdenum selenide (Shimakawa, para [0004] and [0007]).

**9. Claims 3-5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 10-200142 A to Toyoda et al (cited by applicant in IDS, an English translation has been provided with this office action for applicant's convenience).**

Regarding claim 3, Toyoda discloses a process for producing an integrated thin-film solar cell comprising a substrate and constitutional thin films containing a metal back electrode layer on the substrate, a multi-element compound semiconductor thin film having a p-type conductivity and being provided as a light absorbing layer on the metal back electrode layer, a metal oxide semiconductor thin film having an opposite

type conductivity against the multi-element compound semiconductor thin film, having a wider bandgap, being transparent, having electroconductivity, and being provided as a window layer on the multi-element compound semiconductor thin film, and a buffer layer comprising a mixed crystal compound semiconductor thin film at an interface between the light absorbing layer and the window layer, wherein the process comprises a first patterning step of patterning (forming a pattern) by removing a part of the metal back electrode layer in a thin line form, a second patterning step of patterning (forming a pattern) by removing a part of the light absorbing layer or a part of the light absorbing layer and the buffer layer in a thin line form with a prescribed offset with respect to the pattern formed in the first patterning step as a reference position, and a third patterning step of patterning (forming a pattern) by removing a part of the light absorbing layer, the buffer layer and the window layer in a thin line form with a prescribed offset with respect to the pattern formed in the first patterning step or the second patterning step as a reference position, wherein the second patterning step and the third patterning step are conducted by a mechanical scribing method of removing a part of a target accumulated thin film layer by mechanically scribing with a metal stylus having a pointed tip end, in which the tip end of the metal stylus is slid to remove the layers up to the light absorbing layer by mechanically scribing, and wherein the first patterning step, the second patterning step and the third patterning step are conducted in this order, so as to remove mechanically the constitutional thin film layers of the target thin-film solar cell and to form grooves or gaps for dividing the thin-film solar cell into unit cells in a strip shape, whereby an integrated thin-film solar cell having a structure containing a

prescribed number of the divided unit cells being connected in series is obtained (Toyoda, para [0004-0007] and figure 5)

Toyoda does not explicitly disclose using an ultrathin film layer formed secondarily on a surface of the metal back electrode layer upon forming the light absorbing layer as a solid lubricant for the mechanical scribing step. However, Toyoda discloses that a thin film of  $\text{MoSe}_x$  exists on a surface of the metal back electrode layer (Toyoda, para [0008]). This  $\text{MoSe}_x$  layer would either inherently or would be expected to act as a solid lubricant for the mechanical scribing step as the mechanical scribing step of Toyoda appears to be no different than the instantly claimed mechanical scribing step. Therefore, a rejection based alternatively on either 35 U.S.C. 102(b) or 35 U.S.C. 103(a) is eminently fair and acceptable.

Regarding claim 4, Toyoda discloses that the metal back electrode layer is molybdenum and the first patterning step is conducted by a laser method (Toyoda, para [0004-0007]).

Regarding claim 5, Toyoda discloses that the metal back electrode layer is molybdenum, and the ultrathin film layer formed secondarily on the surface of the metal back electrode layer is molybdenum selenide (Toyoda, para [0004-0008]).

#### ***Claim Rejections - 35 USC § 103***

**10. Claim 6 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 2002-319686 to Shimakawa**



**et al (cited by applicant in IDS, an English translation has been provided with this office action for applicant's convenience).**

Regarding claim 6, Shimakawa discloses a process for producing an integrated thin-film solar cell as described above. Shimakawa does not explicitly disclose that the grooves or gaps formed in the second patterning step and the third patterning step have a width of from 30 to 50  $\mu\text{m}$  and a length of 1 m or more. However, where the only difference between the prior art and the claims is the recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior device, the claimed device is not patentably distinct from the prior art device (see MPEP 2144.04 IV). The device resulting from the method of Shimakawa does not appear to perform differently from the device resulting from the instantly claimed method, and as such the instantly claimed method is not patentably distinct from the method of Shimakawa.

**11. Claim 6 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 10-200142 A to Toyoda et al (cited by applicant in IDS, an English translation has been provided with this office action for applicant's convenience).**

Regarding claim 6, Toyoda discloses a process for producing an integrated thin-film solar cell as described above. Toyoda does not explicitly disclose that the grooves or gaps formed in the second patterning step and the third patterning step have a width of from 30 to 50  $\mu\text{m}$  and a length of 1 m or more. However, where the only difference between the prior art and the claims is the recitation of relative dimensions of the

claimed device and a device having the claimed relative dimensions would not perform differently than the prior device, the claimed device is not patentably distinct from the prior art device (see MPEP 2144.04 IV). The device resulting from the method of Toyoda does not appear to perform differently from the device resulting from the instantly claimed method, and as such the instantly claimed method is not patentably distinct from the method of Toyoda.

***Response to Arguments***

12. Applicant's arguments filed 10/21/2009 have been fully considered but they are not persuasive.

Applicant argues that both Shimakawa and Toyoda disclose that the MoSe<sub>x</sub> layer present in the conventional method disclosed in both Shimakawa and Toyoda causes problems in the resultant solar cell and both Shimakawa and Toyoda teach methods for removing said MoSe<sub>x</sub> layer. This is not found persuasive because regardless of whether Shimakawa and Toyoda teach removing the MoSe<sub>x</sub> layer, Shimakawa and Toyoda teach that the MoSe<sub>x</sub> layer is NOT removed in the conventional methods, and Shimakawa and Toyoda both disclose the conventional methods in addition to allegedly disclosing methods in which the MoSe<sub>x</sub> layer is removed. Even if Shimakawa and Toyoda state that there are undesirable results associated with the conventional method, the conventional method appears to meet the limitations of the instant claims and as such Shimakawa and Toyoda read on the instant claims.

***Conclusion***

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Walck whose telephone number is (571)270-5905. The examiner can normally be reached on Monday-Friday 9 AM-6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571)272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian Walck/  
Examiner, Art Unit 1793  
/Scott Kastler/  
Primary Examiner, Art Unit 1793